5. Services Composition

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Services Composition

- Service Oriented application is composed by a set of services

- Services are (sometimes) aggregation of other services

- We speak about

  - Orchestration

  - Choreography

  - Mashups

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Business Process Execution Language (WS-BPEL)

Dance

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Orchestration

- Describes the automated arrangement, coordination, and management of services

- Represented by BPEL – runtime **executable process**

- Coordination of events in a process

- Directs and manages the on-demand assembly of multiple component services to create a composite application or business process.

Choreography

- Multi-party Collaboration

- Choreography(Collaboration) Description Language (WS-CDL) – language for describing **multi-party contracts** (extension of WSDL)

- Describes the message exchange patterns

- Applies to shared co-ordination across multiple autonomous systems

- Can be used to monitor message exchanges

Choreography Types

- **Abstract Choreography** defines
  - Type of information exchanged
  - Sequences and conditions
- Does not cover
  - Physical message structures
  - Endpoints
  - Messaging conditions and control

Choreography Types

● **Portable Choreography** defines

- o Physical structure of the information that is exchanged (incl. WSDL, port types, operations)

- o Details of technology used (security, reliability)

- o Rules that express the conditions that are used to control the sequence of exchange of information

Choreography Types

● Final type of choreography is **Concrete Choreography** with all the details specified

	Abstract	Portable	Concrete
Types of Messages	Identified	Identified	Identified
Message Structure	Not Defined	Defined	Defined
Conditions	Identified	Identified	Identified
Condition evaluation rules	Not defined	Defined as far as possible	Defined as far as possible
Technology used	Not defined	Defined	Defined
Message Endpoint Data	Not defined	Not Defined	Defined

Choreography Model

- Participants, Roles and Relationships

- Choreography Structure

- Choreography Composition and Import

- Types, Variables and Tokens

- Interactions

- Activities and Control Structures

- Choreography Exceptions and Transactions

- Semantics

Mashup

- *Mashup* is a web page or application that uses and combines data, presentation or functionality from two or more sources to create new services

- Data mashups – composed service from several data sources (uses single representation)

- Consumer mashups – combines different data types (visual elements and data from various sources)

- Business mashups – combined application

Mashup

Mashups
Software Composition for the Web

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http://www.jopera.ethz.ch/research/usi-mashup.pdf